

The Use of Plant Growth Regulators Near Harvest

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To help growers time the applications of ReTain we give the following predictions.

- Gala normal harvest begins about Sept. 7 but this year we expect Gala harvest to begin Sept. 1 **or earlier.**
- Honeycrisp normal harvest begins about Sept. 12 but this year we expect Honeycrisp harvest to begin Sept. 5 **or earlier.**
- McIntosh normal harvest begins about Sept. 10 but this year we expect McIntosh harvest to begin Sept. 3 **or earlier.**

As we get closer to harvest follow the **Harvest Maturity Reports** and test your apples to dial in ideal harvest timing.

Predictions for Harvest 2024

- Pre-harvest drop:** While we have had relatively few days this season with temperatures greater than 90°F, we have had many periods during the growing season with temperatures in the mid to high 80s with intense sunlight. We have already seen some preharvest drop in Premier Honeycrisp and a few Macintosh. Thus, we expect a moderate to high risk of preharvest drop.
- Color development:** Temperatures lately have been cooler than normal, but the projected forecast for September is slightly warmer than normal which may delay early color.
- Fruit size:** Fruit size is very large due to good heat units so far and great water supply.
- Bitter pit:** Our early peel sap results show a fairly good Ca level and a good K/Ca and N/Ca ratios; Thus, we expect a low risk of bitter pit overall except where frost or overthinning reduced crop load where we expect significant bitter pit.
- Chilling injury:** The predicted warmer than average temperatures in the second half of August indicate a lower risk of chilling injury than last year. Thus, storage temperatures for chilling sensitive varieties should be 38°F.

Suggested timings and rates of ReTain for pre-harvest drop control, harvest management and control of greasiness. Cracking, internal flesh pigmentation and stem end flesh browning.

- **Gala.** Almost all Gala blocks that are destined for long-term storage should receive Retain before harvest to control stem end flesh browning. We recommend the application of only ½ pouch/acre of ReTain at the 3 week before harvest timing about August 11. Later timings will also control drop, greasiness and cracking and can control stem end flesh browning. (Note from Chris Watkins: we find that the later applications can be just as good as earlier ones for FB control if fruit are stored in low oxygen and 38F, but firmness is compromised if fruit have not been treated with PGRs.) If a further delay of harvest is desired a second application of ½ pouch per acre of Retain should be made 1 week before harvest (about August 25). The two applications of ReTain will permit Gala fruit to remain on the tree an additional 14-21 days resulting in improved fruit size (1 box size with a 21-day delay). Although color development will be delayed if harvest is also delayed then good color will develop. ReTain results in a

more even maturity on the tree. Multiple picks on Gala can be reduced to 2 or even 1 picking in some cases.

- **Honeycrisp** is very sensitive to ReTain and in most cases is not needed; however, in some years there can be significant pre-harvest drop and ReTain can control the drop; however, it must be applied before drop begins. Other farms with large acreages of Honeycrisp can use ReTain to spread out the harvest. We recommend a very low rate of 1/3 pouch per acre of ReTain applied 2 weeks before expected harvest (about August 22) in blocks which have had a drop problem in the past or where harvest delay is needed. A note of caution: ReTain on Honeycrisp can have negative consequences during storage of this variety. If the risk of bitter pit is high (high K/Ca ratio or low crop load), then ReTain will increase the bitter pit incidence during storage. The decision on whether to use ReTain on Honeycrisp should be made only after an assessment of the risk of bitter pit risk.
- **McIntosh** We recommend a combined application of ReTain (1 pouch) + NAA (10ppm) 3 weeks before expected first harvest in years where there are not periods of 90+°F in the month of August. For 2024 which is not predicted to have any days above 90°F we suggest ReTain+NAA be applied about August 13. If a further delay of drop and harvest is needed, then apply a second application of the same tank mix should be applied about August 27.
- **For late September and October varieties** the negative effect of ReTain on fruit color development is much less than for early September varieties, thus we suggest the use of the full pouch/acre of ReTain to provide a consistent reduction of fruit drop and greasiness. For October varieties which are harvested under cooler conditions, application timing should be 3 weeks before normal harvest date (9-15 of September). Treating **Empire, Delicious and Jonagold** provides some flexibility in harvest date since those three varieties need to be harvested at about the same time. **Cortland and Jonagold** both suffer from greasiness problems as the fruit mature and ReTain applied 3 weeks before normal harvest can be a very effective control strategy. **Idared and Rome** both suffer from internal flesh pigmentation (bleeding), which can result in rejection of the fruit at the processing plant. Our research indicates this problem can be controlled effectively with ½ pouch/acre of ReTain applied in mid-September.
- **Reminder:** It is critical to include an organosilicone surfactant with ReTain. The organosilicone surfactant improves the uptake of ReTain better than other surfactants thus ensuring that sufficient ReTain is absorbed by the leaf to suppress ethylene production.

Suggestions for the use of Harvista

Harvista is a very effective drop control product which can be applied closer to harvest than ReTain (7-10 days or less before anticipated harvest). It does not suppress ethylene production but inhibits its action in the fruit and reduces fruit drop. It has a much more rapid action in the plant than ReTain and can prevent fruit drop even when applied close to harvest. It has a long-lasting effect and will keep fruit on the tree for 4+ weeks which is longer than ReTain. However, like ReTain it also delays red color development. Harvista's active ingredient is 1-MCP which is a gas and thus must be applied with specialized equipment to get consistent results. A note of caution of using Harvista on Honeycrisp. Harvista on Honeycrisp can have negative consequences during storage of this variety. If the risk of bitter pit is high (high K/Ca ratio or low crop load), then Harvista will increase the bitter pit incidence during storage. The decision

on whether to use Harvista on Honeycrisp should be made only after an assessment of the risk of bitter pit risk. Consult your AgroFresh representative for application timing, based on the starch pattern index.

Improving Fruit Red Color

Red color development should be poor in early September of 2024 with warmer than average weather in late August and early September. Using reflective film under the tree is a non-chemical method of improving fruit color. However, among the chemical methods of improving color there are 2 options which have been successful. (We are evaluating other products and will have suggestions for those next year).

- Ethrel (300ppm) improves fruit color if applied 1 week before harvest but stimulates ripening and excessive drop 10 days after application. If NAA is mixed with Ethrel then drop can be delayed 10 days but if the fruit is not harvested on time, then excessive drop will occur. We have not shown any improvement in color from Ethrel with the early ripening strain (Premier) of Honeycrisp
- Blush is a plant growth regulator featuring a jasmonate PGR (active ingredient prohydrojasmon PDJ). We found modest but significant improvements in red color when Blush is applied twice (3 weeks and 1 week before harvest of the regular strain of Honeycrisp. The response was improved by waiting for application until fruit are entering maturation (DA meter reading of 1.25 for Honeycrisp and DA meter reading of 1.45 for poor coloring strains of Gala). We suggest the maximum rate of 52 ounces per acre applied twice.